CLAIMS:

1. A computer-readable medium encoded with a computer program which, when loaded into a processor, is operative to perform a method for quantizing a data set having a plurality of dimensions defined by perpendicular axes, the data set comprising a plurality of data points, each data point having a data characteristic, the method comprising the steps of:

selecting a predetermined number of data classes based on a distribution of the data characteristics of the plurality of data points within the data set, the predetermined number of data classes less than the number of data points;

forming a data structure based on the predetermined number of data classes;

resolving each of the plurality of data points into one of the predetermined number of data classes using a method comprising:

locating a plurality of region centers within the data set, each region center associated with one of the predetermined number of data classes;

representing formation of a plurality of regions within the data set by iteratively expanding a predetermined geometric representation from each region center radially outward, each iteration of expansion of the predetermined geometric representation occurring by an integer unit of measure, the iterative expansion causing adjacent regions to form region boundaries, the region boundaries permitted to be non-parallel to the perpendicular axes; and

after each iteration of expansion, assigning a value to each of the unassigned data points within each region, the assigned value associated with the predetermined data class of a particular region center, the particular region center being the region center associated with the first region to capture the data point during the iterations of expansion;

associating the resolved data points with the data structure; and

using the associated resolved data points, generating a modified representation of the data set.

2. The computer-readable medium according to claim 1, wherein the data set comprises a first digital color image received by the processor and the modified representation of the data set comprises a second digital color image output from the processor.

3. The computer-readable medium according to claim 2, wherein the step of generating a modified representation of the data set further comprises:

replacing the data characteristic of a particular data point in the first digital color image with the assigned value to form the second digital color image; and

displaying the second digital color image using the assigned values of the particular data point.

4. The computer-readable medium according to claim 1, wherein the number of dimensions is three, and the geometric representation comprises a sphere.

5. The computer-readable medium according to claim 4, wherein each data point comprises a pixel and the data characteristic comprises a pixel color.

6. The computer-readable medium according to claim 5, wherein the step of selecting a predetermined number of data classes comprises generating a color look-up-table based on a frequency of a particular pixel color occurring in the first digital color image.

7. The computer-readable medium according to claim 6, wherein the step of generating the color look-up table comprises:

dividing the first digital color image into a plurality of bins each having a subset of n discrete locations;

determining a color center for each of the plurality of bins, the color centers comprising the region centers; and

assigning each color center to a mapping value in a color look-up table.

8. The computer-readable medium according to claim 7, wherein $n = 2^{24}$, and the number of bins is 256.

9. The computer-readable medium according to claim 6, wherein the step of assigning a value to each of the unassigned data points comprises assigning a value associated with the color look-up table.

10. The computer-readable medium according to claim 9, wherein the integer unit for iteratively expanding the sphere comprises an amount equal to the width of one pixel.

11. The computer-readable medium according to claim 10, wherein the sphere is iteratively expanded until each pixel within the first digital image is disposed within one or more regions.

12. The computer-readable medium according to claim 11, wherein the expansion of each region does not affect the expansion of other regions.

13. The computer-readable medium according to claim 1, wherein the number of dimensions is two, and the geometric representation comprises a circle.

14. The computer-readable medium according to claim 1, wherein the number of dimensions is four, and the geometric representation comprises a hypershpere.

15. The computer-readable medium according to claim 1, wherein the step of associating the resolved data points with the data structure further comprises establishing a memory location associated with each resolved data point.

16. The computer-readable medium according to claim 15, wherein each memory location stores values associated with a particular resolved data point, the values comprising: the assigned value, an assertion value indicating whether the particular data

point has been associated with a region center, and a dithering value indicating whether the assigned value is a candidate for dithering.

17. The computer-readable medium according to claim 16, wherein the step of establishing a memory location further comprises maintaining a counter of memory locations not yet having the assigned value.

18. A method for receiving and quantizing a data set originating from collected data, the data set having a plurality of dimensions defined by perpendicular axes, the data set comprising a plurality of data points, each data point having a data characteristic, the method comprising the steps of:

receiving the data set;

selecting a predetermined number of data classes based on a distribution of the data characteristics of the plurality of data points within the data set, the predetermined number of data classes less than the number of data points;

forming a data structure based on the predetermined number of data classes;

resolving each of the plurality of data points into one of the predetermined number of data classes using a method comprising:

locating a plurality of region centers within the data set, each region center associated with one of the predetermined number of data classes;

representing formation of a plurality of regions within the data set by iteratively expanding a predetermined geometric representation from each region center radially outward, each iteration of expansion of the predetermined geometric representation occurring by an integer unit of measure associated with a data point, the iterative expansion causing adjacent regions to intersect and form region boundaries, the region boundaries permitted to be non-parallel to the perpendicular axes; and

after each iteration of expansion, assigning a value to each of the unassigned data points within each region, the assigned value associated with the predetermined data class of a particular region center, the

particular region center being the region center associated with the first region to capture the data point during the iterations of expansion;

associating the resolved data points with the data structure; and

using the associated resolved data points, generating a modified representation of the collected data.

19. The method according to claim 18, wherein the collected data comprises one of: an image captured by an image-collecting device; a seismic measurement of a geographic area; a measurement of an architectural structure; and a measurement of a manufactured device.

20. An apparatus for quantizing a data set having a plurality of dimensions defined by perpendicular axes, the data set comprising a plurality of data points, each data point having a data characteristic, the apparatus comprising:

a computer-readable storage medium; and

a processor responsive to the computer-readable storage medium and to a computer program, the computer program, when loaded into the processor, operative to perform a method comprising:

selecting a predetermined number of data classes based on a distribution of the data characteristics of the plurality of data points within the data set, the predetermined number of data classes less than the number of data points;

forming a data structure based on the predetermined number of data classes;

resolving each of the plurality of data points into one of the predetermined number of data classes using a method comprising:

locating a plurality of region centers within the data set, each region center associated with one of the predetermined number of data classes;

representing formation of a plurality of regions within the data set by iteratively expanding a predetermined geometric representation from each region center radially outward, each iteration of expansion of the predetermined geometric representation occurring by an integer unit of

measure associated with a data point, the iterative expansion causing adjacent regions to intersect and form region boundaries, the region boundaries permitted to be non-parallel to the perpendicular axes; and

after each iteration of expansion, assigning a value to each of the unassigned data points within each region, the assigned value associated with the predetermined data class of a particular region center, the particular region center being the region center associated with the first region to capture the data point during the iterations of expansion;

associating the resolved data points with the data structure; and

using the associated resolved data points, generating a modified representation of the data set.